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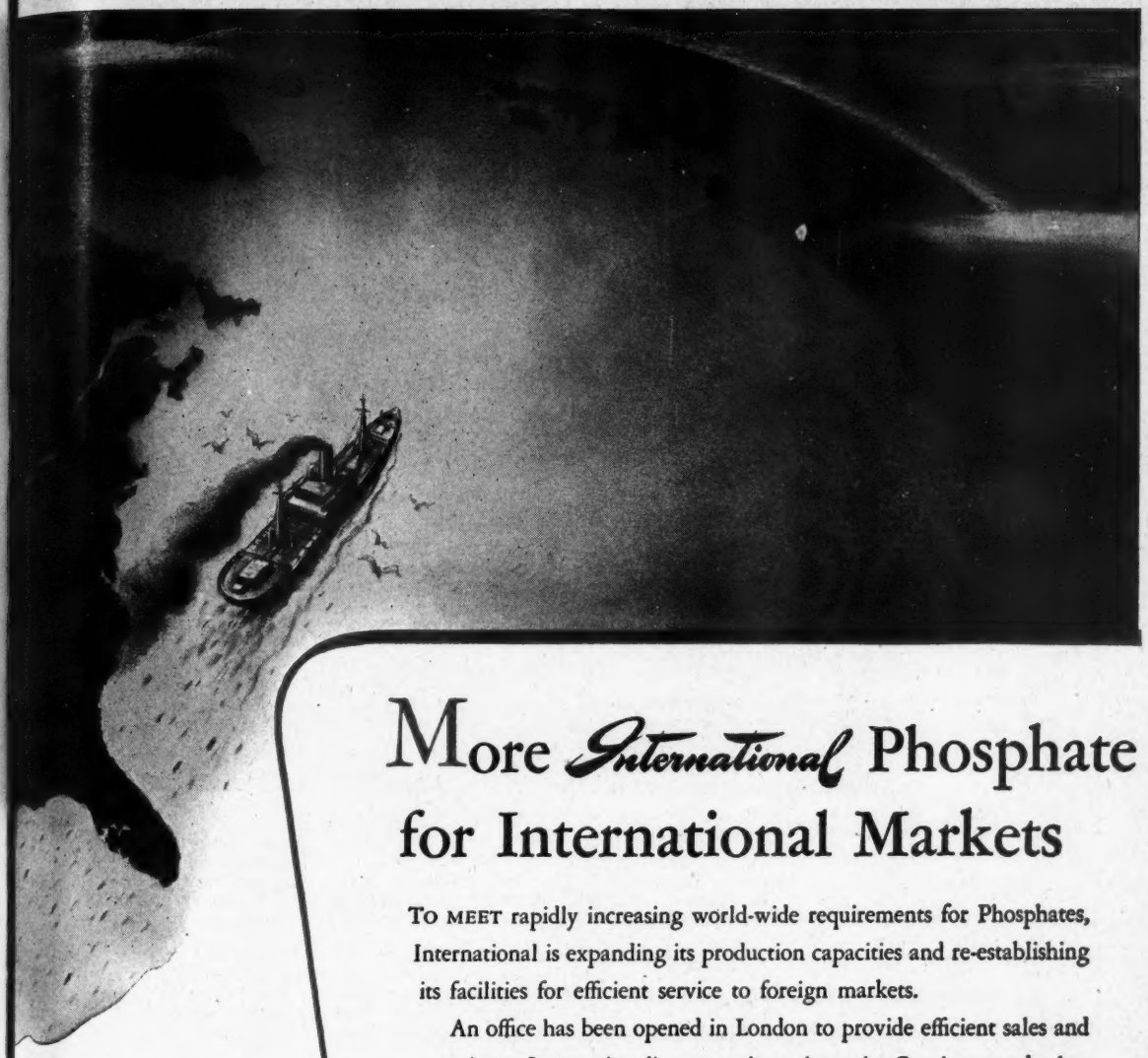

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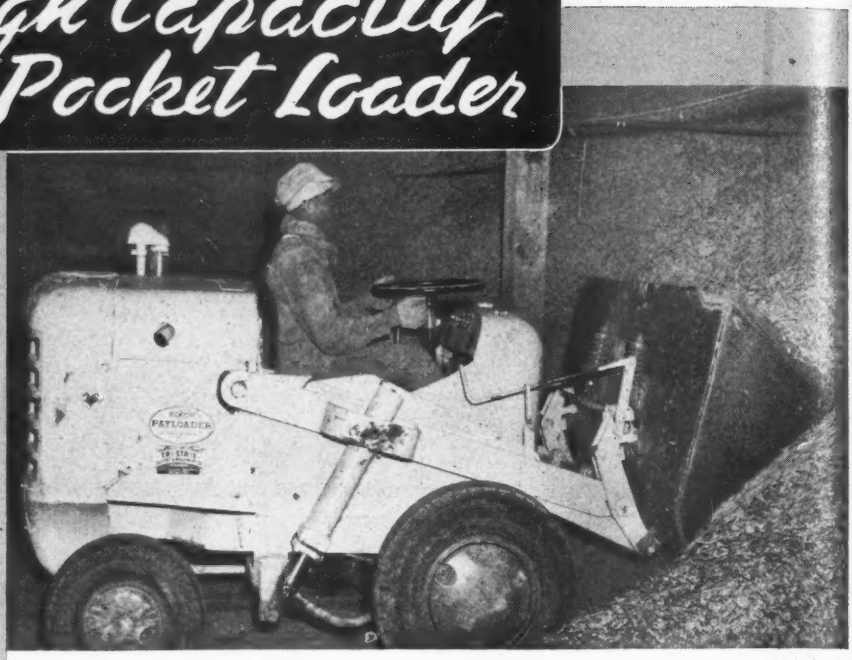

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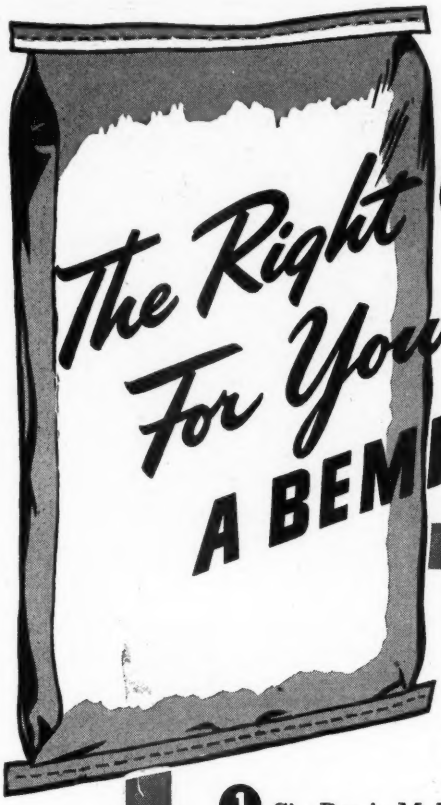

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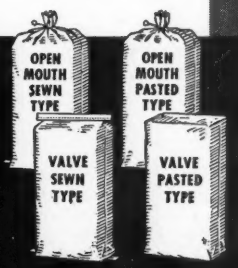

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The American FERTILIZER

Vol. 105 OCTOBER 19, 1946 No. 8

Present Status of Potato Fertilizer Placement

By BAILEY E. BROWN

Formerly Senior Biochemist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, United States Department of Agriculture.[1]

Introduction

SINCE 1930 considerable effort has been devoted to fertilizer placement studies on potatoes. The work still goes on; in fact, the greatest volume of results yet reported was in 1944, covering a total of 18 independent experiments in 11 States.

The writer was recently asked the following question by a group of prominent potato growers: "Just where do we stand on fertilizer placement for potatoes, and has any evaluation been attempted of placement methods thus far considered?" They further said: "Practically all potato growers in the late-crop States have adopted the side-band placement method recommended by the Joint Committee on Fertilizer Application,[2] with very satisfactory results; certainly with much better results than when growers applied the fertilizer in the seed piece furrow."

So pertinent was their inquiry that the writer decided to bring together the results of fertilizer placement studies on potatoes to see if any one method had been found outstanding. In order to do so it was found necessary to review the various *Proceedings* of the Joint Committee on Fertilizer Application covering a period from 1931 through 1944. No attempt has been made to consider any placement studies not involving machine-placed fertilizer.

The chief fertilizer placement methods considered within the 14-year period 1931-1944 have been the following: (1) side-band placement; (2) broken-band placement; (3) "Hi-Lo" band placement; (4) broadcasting, usually combined with side-band placement; and (5) plow-furrow placement.

[Band Placement Studies

In 1931 an experimental program was established by the Michigan, New Jersey, and Ohio Agricultural Experiment Stations in cooperation with the United States Department of Agriculture to compare a number of fertilizer placement methods, chiefly band placements, under actual field conditions.[3] In 1932 the Maine Station and the Virginia

[1] Beginning July 29, 1946, Director, Soil and Fertilizer Research, Summers Fertilizer Company, Inc., Baltimore, Md.

[2] Organizations represented on the National Joint Committee on Fertilizer Application: American Society of Agronomy, American Society for Horticultural Science, American Society of Agricultural Engineers, Farm Equipment Institute, and National Fertilizer Association.

[3] The program was worked out at a meeting held in March, 1931, at the New Jersey Agricultural Experiment Station. Those in attendance were William H. Martin, the late H. R. Smalley, the late Fred H. Bateman, and the writer.

Truck Station joined in the cooperation, and in 1934 the New York (Cornell) Station followed suit. The methods compared were the following:

1. Fertilizer band on each side, one inch from and level with lower plane of seed piece.
2. Same as 1, except that fertilizer was 2 inches from seed piece.
3. Same as 1, except that fertilizer was 4 inches from seed piece.
4. Fertilizer band on each side, 2 inches from and 2 inches below seed piece level.
5. In seed piece row, lightly mixed with the soil.
6. Same as 5, well mixed with the soil.[4]
7. Band underneath seed piece with 1 to 2 inches of fertilizer-free soil interposed.
8. In wide band over seed piece.

Experimental Results from Band Placement

Twenty-seven individual fertilizer placement experiments were conducted during the period the cooperation between the Experiment Stations and the United States Department of Agriculture was in effect, covering a period from 1931 through 1935. Of these 27 experiments, 23 definitely showed that some method of side-band placement produced greater yields than resulted from fertilizer applied in the row, either lightly or well mixed with the soil, or over the seed piece, or in a band 1 to 2 inches under the seed piece (*3, 8*).[5] Of the 23 band placements, 9 gave greatest yields when the fertilizer was applied 2 inches from and on a level with or slightly below the lower plane of the seed piece. It was the concensus of the cooperating agencies that this particular method, in view of its having given the most uniformly favorable results, should be recommended officially as the preferred method of fertilizer placement for potatoes.[6] Accordingly, in 1938, the following recommendation was adopted by the National Joint Committee on Fertilizer Application (*9*): "Fertilizer should be applied in bands on each side of the seed piece with 2 inches of fertilizer-free soil interposed. The fertilizer bands should be on a level with or slightly below the seed piece. On sloping land, in order to avoid fertilizer shifting too close to the seed, it is recommended that the depth of fertilizer placement be about an inch below the seed level."

Band-Placement Results Reported by Other Investigators[7]

Watson (*24*), Extension Horticulturist, North Carolina Agricultural Extension Service, reported on some fertilizer placement studies conducted in 1937 in Beaufort, Camden, Currituck, and Pitt Counties, N. C., on potatoes. The placement comparisons were as follows: (1) Band on each side, 2 inches from and level with seed piece; (2) fertilizer applied with a McWhorter type distributor and mixed with soil.

In Beaufort County the side-band placement of fertilizer gave a greater yield by 13 barrels per acre than the method used by the grower. In a second test in Beaufort County, with the rows 4 feet apart instead of 3¾ feet as in the preceding test, the yield increase for band placement amounted to 15 barrels per acre.

In Camden County the side-band placement outyielded the grower's method by 4.2 barrels per acre. In Currituck County there was recorded a 20-barrel increase in yield per acre of No. 1 potatoes when both seed and fertilizer were placed by the machine at one operation (band placement).

In Pitt County, with rows 3 feet apart, the side-band placement outyielded the grower's method by 26.4 barrels of No. 1 potatoes. With rows planted 3½ feet apart the yield increase for side-band placement amounted to 12.6 barrels of No. 1 potatoes. In two of the foregoing tests, Camden and Currituck Counties, there were, respectively, a 10 per cent and an 11½ per cent better stand when the side-band placement method was used.

Broken-Band Fertilizer Placement

By broken-band fertilizer placement is meant applying fertilizer in short bands adjacent to the seed piece; for example, a band 6 inches in length followed by a break of 6 inches without fertilizer. This, in effect is "spotting" the fertilizer instead of applying it in continuous bands. While broken-band distribution of fertilizer already had been tried on widely spaced crops like corn and tomatoes with good results, the question arose whether a broken-band distribution of fertilizer would work advantageously with a crop planted much closer in the row. In the case of the potato crop many growers plant

[4] Fertilizer distributed throughout the soil zone surrounding the seed piece.

[5] Figures in parentheses refer to "Literature Cited," at end of article.

[6] Proceedings of the 6th, 7th, 8th, 9th, 10th, and 11th Annual Meetings of National Joint Committee on Fertilizer Application contain detailed reports on the band placement experimental studies covering the period from 1931 through 1935.

[7] In certain instances the findings of other investigators on side-band placement are given under the headings of broadcasting and plow-furrow placement.

12 inches apart; but even closer planting is by no means uncommon, particularly by growers producing certified seed stock. If the potato hills are planted 12 inches apart and the rate of fertilizer application is 2,000 pounds per acre for both placements, then it is obvious that, while the rate of application per acre is the same by both methods of placement, the concentration of plant food adjacent to the seed piece is twice as great where the broken-band method is employed. In other words, the 6-inch broken-band fertilizer application, applied at the rate of 2,000 pounds per acre, may be considered to give a plant food concentration adjacent to the seed pieces equivalent to continuous-band concentrations at 4,000 pounds per acre.

In order to determine the efficiency of broken-band fertilizer placement in comparison with continuous-band placement several agricultural experiment stations,[8] in cooperation with the United States Department of Agriculture, inaugurated a program of field studies in 1935 to evaluate the broken-band placement method.

Before attempting a comparison of continuous- and broken-band fertilizer placements it was necessary to provide the potato planter with an attachment that would place the fertilizer in short bands opposite the seed piece at different rates af application per acre.[9] With such an attachment on the potato planter it was practicable to deposit the fertilizer in narrow bands, the same width as the continuous band, of varying lengths. Finally, by calibrating the machine against the rate at which the fertilizer left the hoppers, the quantity of fertilizer in the broken band could be varied as desired. For all continuous- and broken-band methods of fertilizer placement each side band was placed 2 inches from and on a level with, or slightly below, the lower plane of the seed piece.

Experimental Studies and Findings

The continuous-band versus broken-band studies were carried on for the 3-year period, 1935–1937, in New Jersey, New York (L. I.), Michigan, Ohio and Virginia. Broken bands of different lengths, 5, 7.5, and 10 inches, were compared with the continuous-band placement. Detailed reports of the experimental procedures and the results obtained are given in the *Proceedings* of the 11th, 12th, and 13th Annual Meetings (1935, 1936, and 1937) of the National Joint Committee on Fertilizer Application, should the reader be interested in details.

Insofar as these two methods are concerned there was no advantage in resorting to the broken-band placement; in fact, with an occasional exception the continuous-band placement gave higher, although in most cases only slightly higher, yields than the broken-band method. One must consider, too, the greater mechanical difficulties involved in effecting the broken-band placement. This method is not adaptable to stony soil, and considerable delay is entailed in making repairs when a breakdown occurs to the broken-band machine, whereas the grower who applies the fertilizer in continuous bands is by no means as vulnerable to such delays.

In summarizing the results of the field comparisons of these two methods the writer takes the liberty of quoting William H. Martin (*13*), of the New Jersey Agricultural Experimental Station, on his views regarding the two methods with respect to the potato crop under New Jersey conditions. He stated: "Broken-band fertilizer placement appears to offer no advantage over continuous-band placement, particularly when the changes to effect the broken band are considered." As his opinion represented the concensus of the cooperating agencies, it was decided to terminate the study after 1937.

Hi-Lo Fertilizer Placement

About 1940, a suggestion was made by the late Fred H. Bateman to the effect that it might prove desirable to change the position of one of the bands of the standard side-band placement by lowering one band 2 to 3 inches below the level of the lower plane of the seed piece. Mr. Bateman felt that during a droughty period the fertilizer in the lower band would act more efficiently because of a greater moisture supply at the lower depth of fertilizer placement. He designated this particular method of fertilizer distribution 'Hi-Lo" band placement. Mr. Bateman suggested also the employment of unequal-quantity bands whereby the Hi-band received one-fourth of the fertilizer, the Lo-band, three-fourths.

Smith (*21*) conducted some studies on potatoes in 1942, including fertilizer placement and rate of fertilizer application in conjunction with variety, seed spacing, and size of

(Continued on page 28)

[8] Michigan, New Jersey, New York (Cornell University) and Ohio Stations, and the Virginia Truck Experiment Station.

[9] This was satisfactorily accomplished by Glenn A. Cumings, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture.

Fertilizers in Wartime Germany

By K. D. JACOB

Bureau of Plant Industry, Soils, and Agricultural Engineering,
Agricultural Research Administration,
U. S. Department of Agriculture,
Beltsville, Maryland

(Continued from the issues of September 21 and October 5, 1946)

Fertilizers in the Military Occupation Zones of Germany

The military occupation zones of Germany are shown in Fig. 2.[11] For the purpose of this paper no distinction will usually be made between the Soviet occupation and the Polish administration areas; in general, they will be referred to collectively as the Soviet-Polish zone. As of 1937 the national boundaries of Germany encompassed about 181,000 square miles. Of this area, approximately 48 per cent is now in Soviet-Polish occupation zone, while the proportions in the American, British, and French zones are 22. 21. and 9 per cent, respectively.

The distribution of the consumption of plant food as commercial fertilizer among the occupation zones is indicated by the data for the fertilizer year 1938–39 (Table XIII). It will be noted that of the total plant food consumption nearly 50 per cent was in the Soviet-Polish zone, as compared to 15.7, 28.5, and 6.6 per cent in the American, British, and French zones, respectively. The individual plant foods showed only small variations from this distribution pattern.

The distribution of the consumption of chemical nitrogen as fertilizer in 1938–39 was 13.8, 28.3, 6.1, and 51.8 per cent in the American, British, French, and Soviet-Polish zones, respectively (Table XIII). Similarly the distribution of the capacity for production of chemical nitrogen for all purposes was 4.8, 30.3, 26.4, and 38.5 per cent (Table XIV). Thus, the capacity for producing nitrogen was greater than the consumption as fertilizer in all zones except the American. This was especially true of the French zone where the capacity was about 6.5 times the consumption. As the productive capacity figures are based on the maximum outputs of the individual plants, they do not necessarily reflect either the actual or the potential capacities for nitrogen production

Of the synthetic ammonia and cyanamide plants, only one—a cyanamide plant—was in the American zone, compared to five each in the British and the Soviet-Polish zones and three in the French zone. Nearly 45 per cent of the synthetic ammonia capacity was in the Soviet-Polish zone, predominantly in the huge Leuna plant of the I. G. Farbenindustrie near Merseburg. The Oppau plant of I. G. near Ludwigshafen accounted for most of the synthetic ammonia capacity in the French zone. The cyanamide plant in the American zone, which is located at Trostberg, Bavaria, and is operated by the Süddeutsche Stickstoffwerke A. G., had 35 per cent of the total capacity for this type of nitrogen, based on maximum plant performance. The current production of cyanamide at Trostberg is reported to be at a rate sufficient to supply the nitrogen requirements for only the planned

[11]Based on map prepared in the Department of State, Division of Map Intelligence and Cartography, March 1946.

TABLE XIII

CONSUMPTION OF PLANT FOOD IN THE MILITARY OCCUPATION ZONES OF GERMANY, FERTILIZER YEAR 1938–39

Occupation zone	Chemical Nitrogen		P_2O_5		K_2O		Total	
	Metric tons	Percent	Metric tons	Percent	Metric tons	Percent	Metric tons	Percent
American.....	99,000	13.8	127,367	16.7	210,251	16.1	436,618	15.7
British.....	203,500	28.3	216,876	28.4	374,998	28.6	795,374	28.5
French.....	43,600	6.1	61,350	8.1	79,516	6.1	184,466	6.6
Soviet-Polish...	372,100	51.8	356,989	46.8	645,078	49.2	1,374,167	49.2
Total.....	718,200	100.0	762,582	100.0	1,309,843	100.0	2,790,625	100.0

acreage of oilseed, sugar beet, and commercial vegetable crops in the American zone.

Approximately 85 per cent of the byproduct ammonia capacity was in the British zone, mostly at the coke ovens of the Ruhr district. The other principal sources of byproduct ammonia were in Silesia (Soviet-Polish zone) and the Saar (French zone).

The relative distribution of the total consumption of P_2O_5 among the zonal areas in 1938–39 was in the same order and nearly in the same proportion as was that of nitrogen (Table XIII). The distribution of the consumptions of basic slag and superphosphate was also in this order (Table XV). In relation to the consumptions of P_2O_5 the productions in the American and the Soviet-Polish zones showed large deficits, while the French and especially the British areas had surplus productions mostly in the form of basic slag. The P_2O_5 deficits in the American and the Soviet-Polish areas were met principally by shipments of basic slag from the other German areas and by importations from foreign countries.

In 1938–39 about 84 per cent of the total output of slag P_2O_5 was in the British zone and 13 per cent in the French zone. In these zones the respective productions of slag were 236 per cent and 131 per cent of the consumptions. Like byproduct ammonia, the output of slag in the British and French areas was chiefly from the Ruhr and the Saar, respectively. The productions of slag P_2O_5 in the American and the Soviet-Polish zones accounted for only 10 per cent and 4 per cent of the respective consumptions of such P_2O_5 in these zones.

Before the war the twelve plants in the Soviet-Polish zone had 55 per cent of the total productive capacity for superphosphate in Germany, compared to 31 per cent for the 13 plants in the British zone and 14 per cent for the eight plants in the American and French zones. The pre-war capacities for

(Continued on page 22)

Fig. 2. Military occupation zones of Germany as fixed by final decision effective July 12, 1945

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Early Ordering of Fertilizers Urged

Because supplies of high-analysis fertilizers may not be plentiful next year, Prof. P. E. Karraker of the University of Kentucky Experiment Station suggests that farmers place their orders early. Following is his review of the fertilizer situation:

"According to present information, fertilizer supplies during the 1946–47 fertilizer year will be about the same as in the past year. Because of shortage of sulphuric acid there may be less superphosphate than in the past year. Supplies of muriate of potash and of sulphate of potash should be about the same. Supplies of nitrogen fertilizers should be larger than in the past year.

"As in the past two years, to assure obtaining the fertilizer desired for spring use, orders should be placed and delivery taken early in the year. Supplies of straight fertilizers and high-analysis mixed fertilizers probably will not be plentiful. By making a real effort, however, farmers who want these may be able to get them.

"Prices set by the Office of Price Administration for the 1946–47 year on most fertilizers are about $1 a ton higher than in the past year. On the average, the plant food in mixed fertilizer is $7.50 to $8 more per ton than in straight fertilizers. In the case of mixed fertilizers, plant food also as usual is considerably cheaper in the high-analysis than in the low-analysis fertilizers. For example, consider two with the same ratiom the 3–9–6 and the 4–12–8. The latter obviously contains one-third more plant food than an equal quantity of the former. The 1946–47 ceiling prices on these fertilizers are $33 and $39.45 a ton, respectively. If the cost of the plant food was the same in the two fertilizers, compared with the price of the 3–9–6, that of the 4–12–8 should be $44 ($33 plus ⅓ of $33). Subtracting the actual ceiling price of this fertilizer ($39.45) from this calculated price, gives a saving of $4.55 a ton, almost 12 per cent, through buying the 4–12–8 rather than the 3–9–6 at the ceiling prices.

"For wise buying of fertilizers, the thing to consider is the cost of the needed plant food and not of the total amount of fertilizer obtained. Fertilizers cheaper per ton or tag usually are dearer in terms of actual plant food."

Ceilings Removed from Sulphur

The Office of Price Administration announced, effective October 4th, the exemption of sulphur from price control. Sulphur is being exempted because production and producers' stocks are more than adequate to meet demands. On June 30, 1946, producers held stocks substantially larger than the total production for the peak year, 1945. Moreover, sulphur has on the average been selling at below ceiling prices. For these reasons, decontrol should not result in any increase in domestic prices.

Armour Elected Board Chairman of American Potash

Bernard R. Armour, president of the Heyden Chemical Corporation, has been elected chairman of the board of directors of the American Potash and Chemical Corporation, it was recently announced by Frederick Vieweg, president of the company.

The Heyden Corporation owns a substantial amount of outstanding American Potash stock. The new chairman succeeds W. J. Froelich, who resigned.

Dr. Donald B. Keyes, a vice-president of the Heyden Company, and William S. Glazier, a partner of Lehman Brothers, were elected to the board. Dr. Keyes and Robert Brown, a partner of Kuhn, Loeb & Company, were named to serve on the board's executive committee.

Resignations of three other members of the board, Philip W. Collins, S. James Crowley and John P. Wagner, also were announced.

Farmers' Fertilizer Bill in 1945 Was $440 Million

Farmers in the United States spent $440 million for fertilizer in 1945 compared with $400 million in 1944 and $215 million in 1939, according to the U. S. Department of Agriculture. In 1945 farmers spent $2,009 million for feed, $1,071 million for livestock, $870 million for gasoline and other operating costs for motor vehicles, and $2,210 million for hired labor. These expenses were paid out of a gross income from agriculture totaling $24,065 million.

When these and other expenses were all paid, the average realized *net* income of farm operators, per farm, amounted to $2,354 in the United States, with the highest average in California at $6,051, and the lowest in West Virginia at $896.

The ratio of expenditures for fertilizer to gross farm income declined from 2.0 per cent in 1939 to 1.8 per cent in 1945. The regional percentages, indicated in the table below, show the wide variations in the different areas.

	Per Cent
New England	3.0
Middle Atlantic	2.4
South Atlantic	6.0
South Central	3.4
East North Central	1.6
South West Central	1.0
West North Central	0.3
Rocky Mountain Area	0.4
Pacific Coast	0.9
United States	1.8

Peters Company Reopens Office

The brokerage firm of C. B. Peters Company has resumed business with offices in the Graybar Building, 420 Lexington Avenue, New York, according to an announcement by Colonel Carl B. Peters, who was recently released from military service.

August Sulphate of Ammonia

Production of by-product sulphate of ammonia during August totaled 65,251 tons, continuing the level set during July, according to the figures of the U. S. Bureau of Mines. Production for the first 10 months of the year is still 25 per cent behind the same period of 1945. Shipments increased to 73,106 tons, a rise of over 70 per cent above the July figure of 42,639 tons. Stocks on hand accordingly dropped to 38,609 tons on August 31st. There was little change in the figures for ammonia liquor production and shipments.

	Sulphate of Ammonia Tons	Ammonia Liquor Tons NH_3
Production		
August, 1946	65,251	2,237
July, 1946	64,865	2,158
August, 1945	63,350	2,251
January-August, 1946	396,616	15,786
January-August, 1945	528,904	18,809
Sales		
August, 1946	73,106	2,079
July, 1946	42,639	1,847
August, 1945	61,647	2,101
January-August, 1946	389,012	14,769
January-August, 1945	568,941	17,679
Stocks on Hand		
August 31, 1946	38,609	733
July 31, 1946	47,194	823
August 31, 1946	29,072	811

September Tag Sales

The upward trend in fertilizer tag sales continued in September with such sales in that month totaling 559,000 equivalent tons, or 49 per cent greater than sales in September 1945 and 63 per cent above September 1944, according to the compilation of The National Fertilizer Association. Sales in each month of this year, with the exception of April, have been larger than the corresponding month of last year. The 11 Southern States accounted for 401,000 tons, or 39 per cent more than a year ago, while the 5 Midwestern States totaled 158,000 tons, or 84 per cent more than the preceding year. With the exception of Georgia and Louisiana, September sales were higher in each of the States compared with a year ago.

For the first 9 months of 1946, tag sales aggregated 7,234,000 equivalent tons and were 14 per cent greater than the corresponding period of 1945, and 25 per cent greater than 1944. The rise over last year in the Southern States was widespread with gains ranging from a 2 per cent rise in Georgia to a 153 per cent rise in Oklahoma; a slight decline took place in Louisiana. The Southern States averaged a net gain of 11 per cent over the January-September 1945 sales. The relatively greater increase in the Midwest than in the older fertilizer using regions in the East and South, which has been pronounced in recent years, has continued.

FERTILIZER TAX TAG SALES

COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

STATE	SEPTEMBER				JANUARY-SEPTEMBER		
	1946 Tons	1945 Tons	1944 Tons	% of 1946	1946 Tons	1945 Tons	1944 Tons
Virginia	38,216	34,616	41,313	110	547,132	499,250	418,148
N. Carolina	43,919	36,878	24,526	106	1,282,051	1,207,850	1,089,719
S. Carolina	31,514	14,725	10,600	105	724,035	691,980	635,123
Georgia	13,447	22,075	16,808	102	946,189	929,848	883,669
Florida	106,155	60,280	59,740	123	724,232	590,928	581,709
Alabama	20,900	16,300	14,450	113	732,550	649,100	571,850
Tennessee	5,275	5,042	10,439	112	277,694	247,227	229,519
Arkansas	4,250	1,800	4,600	124	137,050	110,200	108,083
Louisiana	61,800	75,050	66,200	97	200,418	207,486	200,920
Texas	62,127	21,630	20,105	165	287,832	174,915	162,249
Oklahoma	13,228	1,000	2,500	253	48,976	19,362	16,851
Total South	400,831	289,396	271,281	111	5,908,159	5,328,146	4,897,940
Indiana	43,877	34,423	17,459	129	491,742	382,040	333,547
Illinois	40,670	27,825	15,350	129	266,553	206,764	139,890
Kentucky	17,325	10,420	15,705	112	277,991	247,241	222,999
Missouri	44,548	10,280	19,364	164	237,759	145,246	132,602
Kansas	11,903	3,000	4,750	152	51,988	34,305	37,496
Total Midwest	158,323	85,948	72,628	131	1,326,033	1,015,596	866,534
Grand Total	559,154	375,344	343,909	114	7,234,192	6,343,742	5,764,474

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FERTILIZER MATERIALS MARKET

NEW YORK

Many Fertilizer Mixers Will Be Short on Materials. Material Production Insufficient To Fill Demand. Box Car Shortage Becomes More Serious. No Relief in Sight in Organics Situation. Phosphate Rock Mines Trying To Increase Production.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, October 14, 1946

There is continued active interest for all basic fertilizer materials, but supplies continue to be tight, and many fertilizer mixers have been unable to cover their entire requirements. Sulphate of ammonia, potash, and superphosphate are being shipped as fast as production permits, but current demand is far from being filled. The shortage of organics is particularly acute at this time, with domestic production at extremely low levels and a complete absence of foreign offerings.

The expected shortage of boxcars is becoming more and more apparent. Shipments of potash and superphosphate have been held up during the past week because of this transportation problem, and it is generally believed that the situation will become more acute in the near future.

Foreign inquiry has declined during the past reporting period due to the fact that quotas have been largely filled for this quarter. Imports of fertilizer materials are practically negligible and there is no prospect of obtaining foreign supplies this year.

Sulphate of Ammonia

A number of fertilizer manufacturers report their inability to cover requirements for this material. Domestic production continues to show an increase over recent months, but available supplies have not been able to meet the heavy call against present contracts.

Nitrate of Soda

Domestic production is curtailed because of the shortage of soda ash, but stocks of imported material have been adequate to take care of seasonal demand. It is reported that further supplies from Chile are now afloat, and a considerable increase in imports can be expected around the first of the year.

Organic Materials

There is a complete absence of offerings in the market today, and no indication that additional supplies will be made available in the near future. Central and South American productions are apparently moving to European markets where higher prices can be obtained.

Superphosphate

The entrance of many new fertilizer mixers into the market has caused the supply situation to become even tighter. Production in some areas has been limited by the availability of sulphuric acid. Triple superphosphate remains exceedingly tight.

Phosphate Rock

This market shows no change over previous weeks, and production cannot catch up to demand until expansion is possible at the mines. There have been small imports of phosphate rock from Curacao, but most of this material has gone to the feed trade.

Potash

Shipments from the mines to established manufacturers are being made as fast as production permits. Government allocations to new mixers have not been announced as yet but are expected shortly.

CHARLESTON

Organic Situation Tighter Than Ever. Lifting Controls from Meat Will Help Production. Feed Market Will Take Most Supplies.

Exclusive Correspondence to "The American Fertilizer"

Charleston, October 15, 1946.

The organic situation is acute as the market is practically bare. Overall result is a reduced proportion of organic nitrogen in all fertilizers and the forcing of manufacturers in the Southeast, particularly, to produce mixed goods with higher mineral nitrogen content.

Organics.—With lifting of controls on the 15th on livestock, meat and its by-products, it is expected that the production of organics such as tankage and blood will increase considerably. How much will be available for use as fertilizer remains to be seen as the

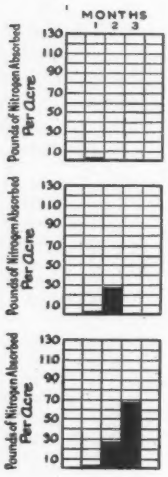
Tomatoes have a growing appetite for nitrogen

IN NEW JERSEY

During the 1st month, tomatoes absorb only about 3% of the total nitrogen they're going to need, according to New Jersey experiments.

In the 2nd month, the tomato plants begin to take hold. Still they use less than one-third of the nitrogen required for full growth.

But in the 3rd month, the tomato plants take up more than two-thirds of the nitrogen required for full growth and maturity.



Conclusion—Tomatoes need a nitrogen fertilizer that resists leaching for more than two months and then is ready to be taken up in large quantities during the last month before harvest.

Your fertilizer fits the crop when you use Urea Nitrogen

Urea nitrogen is completely available to plants, but is resistant to leaching owing to chemical reactions which take place in the soil. As a result, the nitrogen is available when required late in the growing season.

Du Pont UREA-AMMONIA LIQUORS provide an excellent source of urea nitrogen. They're low in cost, easy to handle, and produce quick-curing mixtures that store well and drill well. They also have a low acid reaction in the soil.

To meet the varying requirements of manufacturers, Du Pont supplies four UREA-AMMONIA LIQUORS and URAMON Fertilizer Compound. For additional information, write E. I. du Pont de Nemours & Co. (Inc.), Ammonia Department, Wilmington 98, Del.

NITROGEN THAT FITS THE CROP

DU PONT UREA NITROGEN { **UREA-AMMONIA LIQUORS** • **URAMON** Reg. U.S. Pat. Off. **Fertilizer Compound**

DU PONT REG. U.S. PAT. OFF. BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

demand from the higher paying feed market is expected to take the bulk of production initially. South American Market was higher than domestic as of October 14th and export controls in Argentina were being relaxed somewhat on animal by-products. Little if any animal by-products for feed or fertilizer use have been imported from South America in recent weeks.

Bone Meals.—On account of the low kill at Chicago and other packing-house points, during the OPA control period, supplies are extremely scarce and demand strong.

Blood.—Expected increase in production due to lifting of OPA controls but supply still far behind demand.

Fish Meal and Fish Scrap.—Fish meal quoted if and when made, at *around* $85.00 in bags and dried fish scrap at *around* $80.00. Supplies are snapped up when offered with demand very strong. Supply well below demand.

Nitrate of Soda.—Stocks are low and demand is customary for this time of year. Continued shortage of soda ash is reflected in subnormal production of domestic nitrate of soda. Imported nitrate of soda expected to be in easier supply after January 1, 1947.

Sulphate of Ammonia.—Demand strong but supply still insufficient although movement is fairly steady. Latest OPA price on sulphate of ammonia delivered anywhere in Washington, Oregon and California is $40.15 per ton, bulk, and $41.80 per ton, bagged.

Superphosphate.—Consuming demand very strong and supplies continuing insufficient to cover the call. Practically no stocks can be accumulated as producers try to meet the demand.

Phosphate Rock.—Imports are negligible and reserve stocks of domestic are low. Demand still remains unusually heavy and the general market on rock is tight.

PHILADELPHIA

New Fertilizer Companies Add to Tightness of Material Supply. More Mixed Fertilizer Than Usual Expected. All Materials Short.

Exclusive Correspondence to "The American Fertilizer"

PHILADELPHIA, October 12, 1946

Raw materials contine to be in great demand and complete mixtures are being prepared in greater volume than usual at this season of the year. The market in all materials is tight. Formation of new companies is creating another problem as to supplies.

Sulphate of Ammonia.—Goods are moving right out as produced, but demand is in excess of supply. Export inquiry is strong and very persistent.

Nitrate of Soda.—There is the usual seasonal buying interest, and, while fairly regu supplies of Chilean are coming in, it is said that the available Chilean tonnage will have to be allocated, in view of the demand in the United States and throughout the world. It is expected that the United States will receive as much as last season. Domestic production is hampered by lack of soda ash.

Castor Pomace.—There is some movement on contracts, and a very brish demand, but no new sales reported.

Blood, Tankage, Bone.—These materials are very scarce, with production at lowest level ever. Lifting of export ban by Argentina will not help the fertilizer man, as the feeding people stand ready to grab up all offerings at prices far above the fertilizer valuation.

Fish Scrap.—Very little movement, and all in the feeding trade. Fishing operations are said to be easing off.

Phosphate Rock.—Demand is exceedingly heavy and no accumulations of inventory possible. Shipments are said to be not up to schedule. Export demand is very strong. Maximum price of Florida unground hard

Manufacturers' Sales Agents for **DOMESTIC**

Sulphate of Ammonia

Ammonia Liquor :: Anhydrous Ammonia

HYDROCARBON PRODUCTS CO., INC.

500 Fifth Avenue, New York

rock is reported to have been increased seventy cents per gross ton, due to higher mining costs. Market very tight.

Superphosphate. — Production somewhat hindered by scarcity of sulphuric acid and deliveries are falling behind. Consuming demand is exceedingly active.

Potash.—This continues to be in short supply, and it is again brought out that mixers may get only about 60 per cent of the tonnage applied for. Shipments are said to be moving fairly well under allocation, but the quantities are not satisfying the requirements. The new fertilizer plants are in a very uncertain position, and it is reported that no potash will be allotted to them unless, and until, they have the other necessary raw materials to mix with the potash. Production in France is increasing, but European requirements are expected to absorb most of this for the time being.

CHICAGO

Inquiries for Fertilizer Organics Increase. Feed Materials Being Bartered.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, October 14, 1946

The extreme scarcity of fertilizer materials is further demonstrated by the increasing inquiry coming into this market. Much of this, brokers point out, is from heretofore unknown buyers, and indicates that the trade cannot get supplies from its regular sources.

About the only activity in the feed market is a continuation of bartering one ingredient for another. Tankage protein feeds are practically off the market owing to small production.

American Cyanamid Fellowship To Study Attack on Weed Seeds

The ever-troublesome problem of weed seeds in compost materials is about to be attacked scientifically, through a fellowship established at Rhode Island State College by the American Cyanamid Company, Agricultural Chemicals Division.

The fellowship will be supervised by the College Department of Agronomy. Research will be conducted with granular calcium cyanamide, and perhaps with other chemicals, to develop an efficient and economical means of killing weed seeds in compost materials.

Studies also will be conducted of the use of chemicals in re-vitalizing worn-out pas-

CASE HISTORY No. 9

One in a series of factual experiences of a group of American manufacturers with Multiwall Paper Bags.

COST COMPARISON
(Per Ton)

	200-lb Burlap Bags (Second-hand)	50-lb Paper Bags
Container cost	$1.80	$1.35
Labor cost	.50	.15
Total bag and labor cost	$2.30	$1.50
Saving, paper over fabric		$.80

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CHEMICALS	FOOD
FEEDSTUFFS	MISCELLANEOUS ✓

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ABRASIVE	GRANULAR
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FLUFFY ✓	LIGHT ✓
FREE-FLOWING	VISCOUS

ST. REGIS BAG PACKAGING SYSTEMS are made in a variety of capacities, speeds, and manpower requirements to suit specific products and plant layouts. Machines are available in types to meet the special characteristics of a wide range of products, with filling speeds as high as twenty-four 100-lb. bags per minute — with one operator.

NEW YORK 1
BALTIMORE 2

Allentown
Detroit
No. Kansas

IN CANADA

How a talc producer reduced his packaging costs

and "licked" dust at the same time

This 9th case history in a series of St. Regis Packaging System success stories tells how Cohutta Talc Co. of Dalton, Georgia, has improved working conditions and lowered packaging costs by using a St. Regis valve bag filling machine and multiwall paper valve bags.

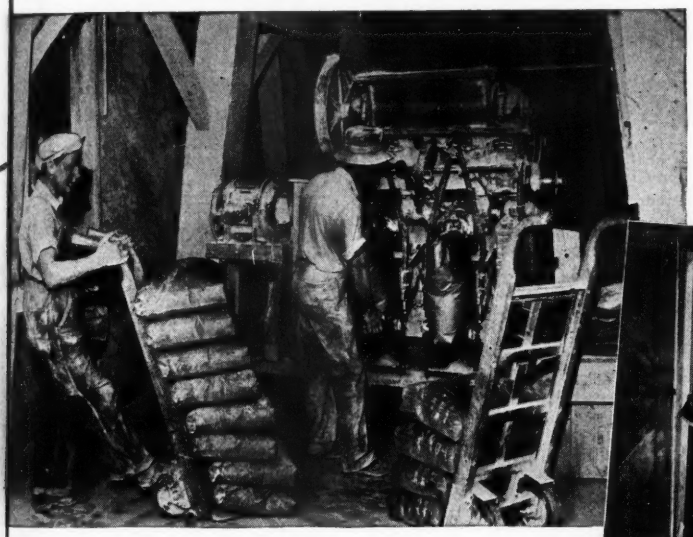
The product, formerly packed in bulky 200-lb. burlap bags, is now packed in easy-to-handle 50-lb. multiwall paper bags.

DUST IS CONQUERED — The St. Regis machine confines the dust during the packing operation and there is no siftage through the bag as in the case of burlap. So the dust problem was immediately eliminated from the packing operation.

BETTER WORKING CONDITIONS WELCOMED — Employees derived great satisfaction from the abatement of the dust nuisance as well as from working with the clean, easy-to-handle 50-lb. paper bags.

LABOR COSTS CUT 70% — A three man crew now packs ten tons an hour. This is *twice* the tonnage that a *five* man crew was able to pack in burlap. Labor cost dropped 70% . . . from 50 cents to 15 cents per ton packed.

TOTAL COST REDUCED — The Cohutta Company reports its per ton cost for burlap bags at $1.80 and for multiwall bags at $1.35 . . . a saving of 45 cents per ton. This, added to the saving in labor costs, results in an overall saving in packaging costs of 80 cents a ton.



(Left) One man operates the St. Regis 107-FC Packer, which simultaneously weighs and fills the 50 lb. multiwall bags.

(Right) Filled bags are easily moved by hand trucks and loaded in freight car.

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Without obligation, please send me full details regarding "Case History" No. 9, outlined above.

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tures and hay lands. It is thought that desirable species of legumes and grasses can be re-established on such lands without cultivation, thus avoiding the danger of serious soil erosion.

The fellowship established at Rhode Island State College is but one of many fellowships established by American Cyanamid Company, Agricultural Chemicals Division.

August Superphosphate Production

The output of superphosphates of all kinds totaled 697,155 tons (basis 18 per cent A. P. A.) according to the U. S. Bureau of Census. This is an increase of 6 per cent over July. Shipments increased 22 per cent to 729,200 tons, while stocks on hand at the end of the month showed 715,811 tons.

Total supply of normal superphosphate showed an increase during August for the second consecutive month. Disposition exceeded production for the first time since May of this year and showed a 20 per cent increase over the previous month while production increased but slightly. Stocks remained at the July level, approximately 25 per cent below stocks on hand a year ago.

Disposition of concentrated superphosphate during August was greater than at any time since February, 1943. There was an increase in the August production as compared with July; however, total disposition continued to exceed production for the second consecutive month. Stocks showed little change during August and were approximately 75 per cent greater than those of August, 1945.

Total supply of wet-base goods increased for the second consecutive month and was 60 per cent above last month's figures. Production, disposition, and stocks all increased seasonally and were well above levels of August, 1945.

	Normal 18%	Concentrated 18%	Base Goods 18%
Production			
August, 1946.....	621,478	28,730	3,852
July, 1946.....	596,812	23,026	3,217
August, 1945.....	638,046	21,617	2,819
Shipments and Used in Producing Plants			
August, 1946.....	648,880	31,552	1,440
July, 1946.....	537,220	23,787	641
August, 1945.....	605,503	24,006	1,004
Stocks on Hand			
August 31, 1946...	592,294	46,507	7,249
July 31, 1946.....	594,739	45,067	4,837
August 31, 1945...	813,694	26,204	4,857

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Manufacturers of Three Elephant Borax and Boric Acid

See page 25

A Complete Service

THE strategic factory locations of The American Agricultural Chemical Company, as shown on the accompanying map, assure prompt, dependable service for the complete line of products listed below.

We manufacture all grades of Commercial Fertilizers, Superphosphate, Agrinite Tankage, Bone Black, Bone Black Pigments (Cosmic Black), Bone Ash, Bone Oil, Dicalcium Phosphate, Monocalcium Phosphate, Gelatin, Agricultural Insecticides (including Pyrox, Arsenate of Lead, Calcium Arsenate, etc.), Trisodium and Disodium Phosphate, Phosphorus, Phosphoric Acid, Sulphuric Acid, Ammonium Carbonate, Ammonium Fluosilicate, Magnesium Fluosilicate, Potassium Fluosilicate, Phosphorus Pentasulphide, Phosphorus Sesquisulphide (lump), Zinc Fluosilicate, Salt Cake; and we are importers and/or dealers in Nitrate of Soda, Cyanamid, Potash Salts, Sulphate of Ammonia, Raw Bone Meal, Steamed Bone Meal, Sheep and Goat Manure, Fish and Blood. We mine and sell all grades of Florida Pebble Phosphate Rock.

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Chambly Canton, Quebec, Can.
Charleston, S. C.
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Cleveland, Ohio
Detroit, Mich.
Greensboro, N. C.
Havana, Cuba
Henderson, N. C.
Montgomery, Ala.
Nat. Stockyards, Ill.
Norfolk, Va.
No. Weymouth, Mass.
Pensacola, Fla.
Pierce, Fla.
Port Hope, Ont., Can.
Savannah, Ga.
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Cleveland, Ohio
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Detroit, Mich.
Greensboro, N. C.
Havana, Cuba
Henderson, N. C.
Houlton, Me.
Laurel, Miss.
Montgomery, Ala.
Montreal, Quebec, Can.
National Stockyards, Ill.
New York, N. Y.
Norfolk, Va.
No. Weymouth, Mass.
Pensacola, Fla.
Pierce, Fla.
Port Hope, Ont., Can.
Savannah, Ga.
Spartanburg, S. C.
Wilmington, N. C.

FERTILIZERS IN WARTIME GERMANY

(Continued from page 11)

production of superphosphate in the British and the Soviet-Polish areas were considerably larger than the 1938–39 consumptions in the respective areas, whereas the productive capacities and consumptions were quite evenly balanced in the American and French areas. It is estimated that damage and destruction resulting from the war has reduced the total capacity for superphosphate production to 186,030 metric tons of P_2O_5 annually, a decrease of 120,000 tons (39 per cent) of which 81 per cent is in the Soviet-Polish zone. The zonal distribution of the present capacity is estimated to be as follows: American, 28,030; British, 73,450; French, 12,900; and Soviet-Polish, 71,650 tons.

The only plant for production of Rhenania phosphate is at Brunsbuettelkoog, Schleswig-Holstein, in the British zone. It is operated by the Kali-Chemie A. G., and it suffered no damage during the war. Depending on the type of raw material used, its capacity ranges from about 23,000 to 30,000 metric tons of available (ammonium citrate-soluble) P_2O_5 annually. Production of Nitrophoska was entirely controlled by the I. G. Farbenindustrie. It was manufactured at Ludwigshafen

TABLE XIV

STATISTICS ON CHEMICAL NITROGEN FOR THE MILITARY OCCUPATION ZONES OF GERMANY

	Occupation zone				
	American	British	French	Soviet-Polish	Total
Synthetic Ammonia					
No. of plants	....	4	2	2	8
Capacity[1]	....	168,500	268,600	354,000	791,100
Calcium Cyanamide					
No. of plants	1	1	1	3	6
Capacity[1]	50,000	24,000	15,000	54,000	143,000
Byproduct Ammonia					
Capacity[1]	3,000	141,000	6,500	15,550	166,450
Total					
Capacity[1]	53,000	333,900	290,100	423,550	1,100,550
Consumption, 1938–39[2]	99,000	203,500	43,600	372,100	718,200

[1]Metric tons of N per year, based on the maximum quantities produced by the individual plants in any year.

[2]Metric tons of N consumed as fertilizer in fertilizer year 1938–39.

TABLE XV

STATISTICS ON PHOSPHATE FOR THE MILITARY OCCUPATION ZONES OF GERMANY

	Occupation zone				
	American	British	French	Soviet-Polish	Total
Basic Slag					
No. of plants	1	11	4	1	17
Production, 1938–39[1]	8,800	353,500[2]	53,500[2]	7,200	423,000
Consumption, 1938–39[3]	87,621	149,736	40,434	197,692	475,483
Superphosphate					
No. of plants	6	13	2	12	33
Capacity[4]	28,430	95,950	12,900	168,750	306,030
Consumption, 1938–39[3]	25,805	37,053	12,785	101,296	176,939
Other Phosphates					
Consumption, 1938–39[3]	13,941	30,087	8,131	58,001	110,160
Total					
Consumption, 1938–39[3]	127,367	216,876	61,350	356,989	762,582

[1]Metric tons of P_2O_5 produced in fertilizer year 1938–39.

[2]Estimated.

[3]Metric tons of P_2O_5 consumed as fertilizer in fertilizer year 1938–39.

[4]Metric tons of P_2O_5; estimated plant capacity for fertilizer year 1938–39.

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Fertilizer plants all over the country—large and small—state their needs and we meet them. Large stocks of seasoned materials and ample modern production facilities enable us to make prompt shipments.

TRIPLE SUPERPHOSPHATE

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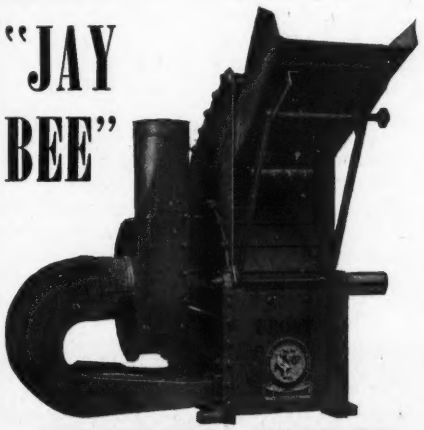

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(French zone) and principally at Piesteritz (Soviet zone).

As indicated by the data for 1938–39 (Table XIII), the zonal distribution of the consumption of potash fertilizer in Germany followed the same pattern as that of nitrogen and phosphate. As with nitrogen, the capacity for potash production was greater in the Soviet-Polish zone than in any of the other occupation areas (Table XVI). It amounted to 61 per cent of the total capacity, while the

TABLE XVI

STATISTICS ON POTASH FOR THE MILITARY OCCUPATION ZONES OF GERMANY

	Occupation zone				
	American	British	French	Soviet-Polish	Total
No. of plants	2	7	1	14	24
Capacity[1]	283,200	374,400	67,560	1,105,200	1,830,360
Consumption, 1938–39[2]	210,251	374,998	79,516	645,078	1,309,843

[1]Metric tons of K_2O; normal production capacity.
[2]Metric tons of K_2O consumed as fertilizer in fertilizer year 1938–39.

corresponding figures for the American, British, and French zones were 15, 20, and 4 per cent, respectively. For the whole of Germany the productive capacity for potash exceeded its 1938–39 consumption as fertilizer by some 520,500 tons, whereas for the Soviet-Polish zone alone the spread was 460,100 tons. In the American zone the capacity also exceeded the consumption, but the reverse was true of the French zone. Capacity and consumption were evenly balanced in the British zone. It is worthy of note that potash is the only one of the three major plant foods in which the American zone is self-sufficient.

Of the 220 locations of German potash mines indicated by Nadler, 125 are in the Soviet-Polish zone, 78 in the British zone, 12 in the American zone, and two in the French zone. The potash mines of the Soviet-Polish zone are, with few exceptions, in the area embraced by the Soviet-occupied provinces of Thuringia, Halle-Merseburg, and Magdeburg; they include the Bleicherode, Glückauf-Sondershausen, Sollstedt, and Volkenroda mines in the Südharz district and the Heiligenroda, Kaiseroda, and Sachsen-Weimar mines in the Werra district. The British-zone mines are scattered over the province of Brunswick and much of Hanover. The mines of the American zone are in eastern and southeastern Kurhesse; the nine locations in the Werra district of eastern Kurhesse include the Wintershall and Hattorf mines, while the other three locations are south of Fulda. In the French zone the mines are just south of Freiburg, Baden.

Summary

Data are given on Germany's wartime production, export, import, and consumption of nitrogen, phosphoric oxide, and potash in commercial fertilizers.

Germany consumed 2,790,625 metric tons of plant food in the fertilizer year 1938–39, but subsequently the annual consumption decreased more or less steadily—markedly during the last two years of hostilities—and is estimated to have amounted to only 1,015,265 tons in 1944–45. Consumption of chemical nitrogen as fertilizer decreased from 718,200 tons in 1938–39 to about 120,000 tons in 1944–45, and the consumption of P_2O_5 decreased from 762,582 to 145,265 tons. Potash consumption—1,309,843 tons in 1938–39—rose to 1,392,064 tons in 1940–41 and did not show a marked decrease until 1943–44; it amounted to about 750,000 tons in 1944–45.

Based on the maximum performances of individual plants in any year, the wartime capacity for production of chemical nitrogen

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See Page 20

by all plants in the Old Reich (boundaries of 1937) amounted to 1,100,550 metric tons annually. It comprised 791,100, 166,450, and 143,000 tons in synthetic ammonia, byproduct ammonia, and cyanamide plants, respectively. Plant destruction and damage is estimated to have reduced the total capacity to less than 550,000 annually. Of the more than 15 different chemical nitrogen products used as fertilizer in Germany, straight ammonium sulphate, Kalkammonsalpeter (Cal-Nitro or Nitro-Chalk), and calcium cyanamide together accounted for some 60 to 85 per cent of the annual consumption of nitrogen.

In 1943-44, 99 per cent of the production of fertilizer P_2O_5 was in the form of basic slag, compared to 80 per cent in 1938–39. Basic slag being a byproduct of steel manufacture, its production was maintained at a high level until the last year of the war, whereas the output of superphosphate, Rhenania phosphate, and other phosphate fertilizers, all of which are derived from imported phosphate rock, was drastically curtailed in the first year of the war and suffered further decrease in subsequent years. The total capacity for production of superphosphate in pre-war Germany amounted to about 306,000 metric tons of P_2O_5 annually; this was reduced to about 186,000 tons by bombing and other war causes.

Potash production and export averaged 1,736,000 and 328,000 metric tons of K_2O annually in the period 1939 to 1944, while consumption as fertilizer averaged about 1,254,000 tons. The consumption was chiefly in the form of potassium chloride containing 40 per cent of K_2O. In general, the potash mines and refineries escaped serious damage.

On the basis of the data for 1938–39, the distribution of the normal consumption of total plant food among the military occupation zones of Germany is nearly 50 per cent in the Soviet-Polish zone, as compared to 15.7, 28.5, and 6.6 per cent in the American, British, and French zones, respectively. The individual plant foods showed only small variations from this distribution pattern.

Of the pre-bombing capacity for production of chemical nitrogen, 38.5 per cent was in the Soviet-Polish zone and only 4.8 per cent the American zone. Approximately 85 per cent of the byproduct ammonia capacity was in the British zone, mostly at the coke ovens of the Ruhr district. Also, nearly 85 per cent of the capacity for production of basic slag was in the British zone. The British and the Soviet-Polish zones have, respectively, 39.5 and 38.5 per cent of the present capacity for superphosphate. The distribution of the capacity for potash production is 61, 15, 20, and ~ per cent in the Soviet-Polish, American, British, and French zones, respectively.

American Potash Institute Holds Board Meeting

The Board of Directors of the American Potash Institute held its annual budgetary meeting at the Chemists' Club in New York City on September 30th. The three Member Companies of the Institute were represented respectively by Frederic Vieweg of Los Angeles, President, and Major Fred N. Oliver, New York, Counsel of the American Potash and Chemical Corporation; James B. Grant, of Denver, Chairman of the Board of Directors of the Potash Company of America; and Horace M. Albright, New York, Preisdent of United States Potash Company.

Among the appropriations authorized, as reported by Dr. J. W. Turrentine, Chairman of the Board, was that providing for the continuation of some 45 research grants currently maintained in the agricultural colleges and experiment stations of the United States and Canada. These grants are in aid of research on problems fundamental to the balanced nutrition of farm crops. In the various states where maintained they relate to local problems as determined by crop requirements and the characteristics of the soils on which they are grown. In the colleges and universities where established as research fellowships, they contribute to the maintenance of students doing post-graduate work in agricultural subjects. The results of these various researches appear in official bulletins and in articles published in the scientific journals.

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POTATO FERTILIZER PLACEMENT

(Continued from page 9)

seed piece. He compared the side-band method, with a Hi-Lo method 20 times. For the twenty comparisons the standard side-band method yielded at the average rate of about 269 bushels and the Hi-Lo at 286 bushels per acre, a difference of 17 bushels in favor of the Hi-Lo method.

Smith, Kelly and Hommel (*22*) conducted further studies in 1943 that dealt with the relation of fertilizer placement, rate of fertilizer application, source of nitrogen and potassium, irrigation, and seed piece spacing to yields of potatoes. Their results showed that the average yield of 29 comparisons was 243 bushels per acre for the standard side-band method of fertilizer placement compared with 241 bushels for the Hi-Lo method, a difference of only 2.0 bushels per acre in favor of the side-band method. Thus, in 1942, on the basis of an over-all average, the Hi-Lo method was shown to be the better method of fertilizer placement for potatoes; in 1943, the two methods gave practically identical yields.

J. C. Campbell *et al.* (*4*), following three years' work, (1940–1942) conducted on Sassafras loam in New Jersey and on Caribou loam, in Aroostook County, Maine, reported that the Hi-Lo placement method failed to show any advantage over the side-band placement. Regarding the relative merits of these two placement methods, Hi-Lo and side-band placement, the writer stated: "In the practical evaluation of these two placement methods, it should be considered that certain mechanical difficulties are involved in any attempt to place fertilizer 2 to 3 inches below the seed-piece level by the Hi-Lo method. To do so requires a larger disk which is subject to breakage in rocky soil or for other causes, with consequent loss of valuable time to make replacements during the planting period. As no such difficulty is encountered in using the standard side-band method, potato growers are generally inclined to favor this particular method of fertilizer placement."

Westover (*25*), of the West Virginia Station, compared standard side-band placement with two Hi-Lo placements, (1) 50 per cent of fertilizer in Hi-band, 50 per cent in Lo band, and (2) 25 per cent in Hi-band, 75 per cent in Lo-band, on Irish Cobbler and Smooth Rural varieties and reported that no yield differences approaching significance were obtained.

(To be concluded in the next issue)

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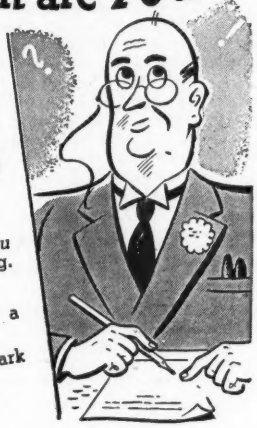

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

of THE AMERICAN FERTILIZER, published bi-weekly at Philadelphia, Pa., for October 1, 1946.

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Before me, a Notary Public, in and for the State and county aforesaid, personally appeared A. A. Ware, who, having been duly sworn according to law, deposes and says that he is the editor of THE AMERICAN FERTILIZER, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Scar-Lipman & Co., Inc., New York City.

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

FERTILIZER (Mixed) MANUFACTURERS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals and Chemical Corporation, Chicago, Ill.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston. S. C.
Scar-Lipman & Co., Inc., New York City.

FOUNDERS AND MACHINISTS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

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IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Scar-Lipman & Co., Inc., New York City.

INSECTICIDES
American Agricultural Chemical Co., New York City.
McLaughlin GormleyKing Co., Minneapolis, Minn.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.

LOADERS—Car and Wagon
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Chemical Construction Corp., New York City.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Hough Co., The Frank G., Libertyville, Ill.
Hayward Company, The, New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Grinding and Pulverizing
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Sackett & Sons Co., The A. J., Baltimore, Md.
Sedberry, Inc. J. B., Franklin, Tenn. and Utica, N. Y.
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Utility Works, The, East Point, Ga.

MACHINERY—Material Handling
Hayward Company, The, New York City.
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Mixing, Screening and Bagging
Exact Weight Scale Co., Columbus, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

NITRATE OF SODA
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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Bradley & Baker, New York City.

NITRATE OF SODA—Continued
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International Minerals & Chemical Corporation, Chicago, Ill
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Ruhm, H. D., Mount Pleasant, Tenn.
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.
Virginia-Carolina Chemical Corp., Richmond, Vc.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

POTASH SALTS—Manufacturers
American Potash and Chem. Corp., New York City.
Potash Co. of America, New York City.
International Minerals & Chemical Corp., Chicago, Ill.
United States Potash Co., New York City.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

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Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

ROUGH AMMONIATES
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

SCALES—Including Automatic Bagging
Exact Weight Scale Co., Columbus, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

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SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City.
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Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

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Texas Gulf Sulphur Co., New York City.
Virginia-Carolina Chemicrl Corp., Richmond, Va.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
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McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE
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Bradley & Baker, New York City.
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Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
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Scar-Lipman & Co., Inc., New York City.
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U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

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International Minerals & Chemical Corporation, Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

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American Agricultural Chemical Co., New York City.
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Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

UREA
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UREA-AMMONIA LIQUOR
DuPont de Nemours & Co., E. I., Wilmington, Del.

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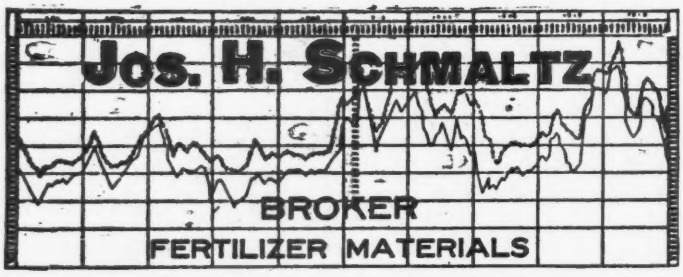

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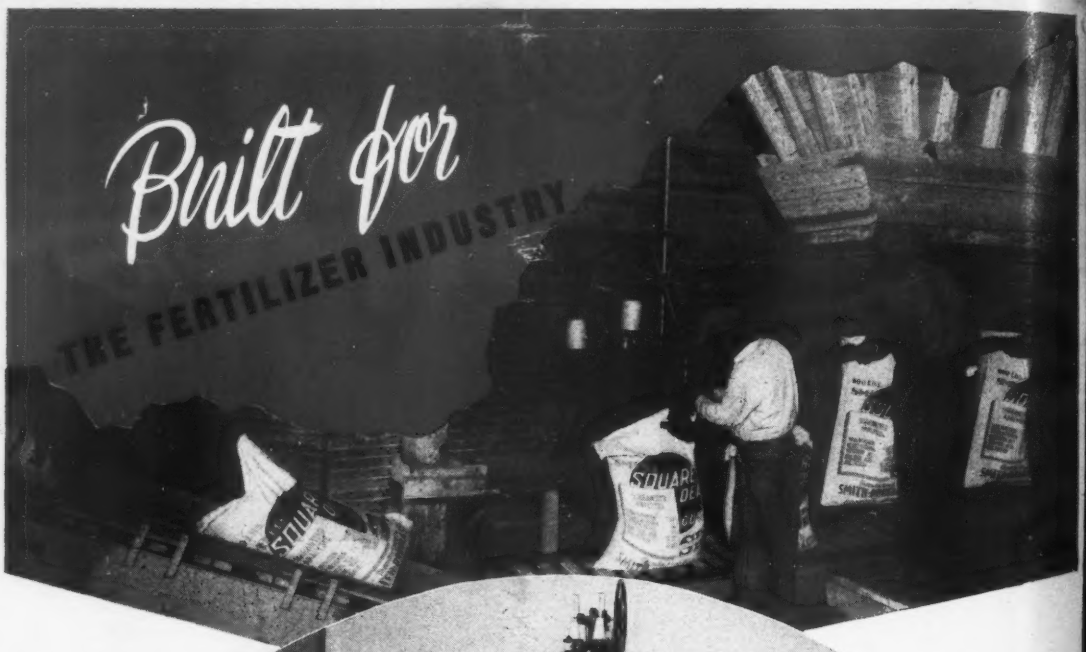

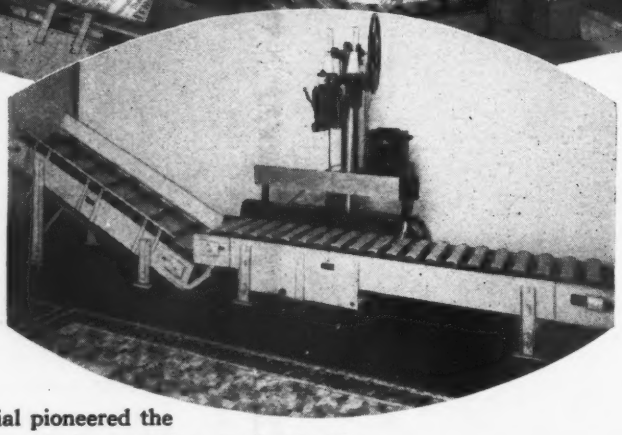

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